

**BEFORE
THE PUBLIC SERVICE COMMISSION OF
SOUTH CAROLINA
DOCKET NO. 2018-1-E**

In the Matter of)	
Annual Review of Base Rates)	DIRECT TESTIMONY OF
for Fuel Costs for)	GEORGE V. BROWN FOR
Duke Energy Progress , LLC)	DUKE ENERGY PROGRESS, LLC
)	
)	
)	
)	

I. INTRODUCTION AND PURPOSE

Q. PLEASE STATE YOUR NAME AND BUSINESS ADDRESS.

A. My name is George V. Brown and my business address is 400 South Tryon St., Charlotte, North Carolina, 28202.

Q. BY WHOM AND IN WHAT CAPACITY ARE YOU EMPLOYED?

A. I am General Manager of Strategy, Policy, and Strategic Investment in the Distributed Energy Technology group at Duke Energy Corporation. I am responsible for the development and execution of strategy and policy support related to distributed energy technology for Duke Energy's retail franchises, including Duke Energy Progress, LLC ("DEP" or the "Company") and Duke Energy Carolinas, LLC ("DEC," together with DEP, the "Companies"). This includes evaluation of legislation and regulation, and implementation of customer programs such as those associated with Act 236 (the "Act"), the South Carolina Distributed Energy Resource Act of 2014.

Q. PLEASE BRIEFLY DESCRIBE YOUR EDUCATIONAL BACKGROUND AND WORK EXPERIENCE.

A. I received a Bachelor of Arts in Economics at Harvard College and a Masters in Business Administration at New York University. I have been employed at Duke Energy since 1998 in a variety of Finance and Strategy roles.

Q. HAVE YOU TESTIFIED BEFORE THIS COMMISSION BEFORE?

A. Yes. I testified before the Public Service Commission of South Carolina ("PSCSC" or "Commission") in DEP's 2017 annual fuel and environmental cost recovery proceedings in Docket No. 2017-1-E.

Q. WHAT IS THE PURPOSE OF YOUR TESTIMONY?

A. The purpose of my testimony is to provide support for the Distributed Energy Resource Program (“DERP”) costs that are incorporated into the proposed fuel factors prepared by Witness Ward. I will describe the nature of costs filed as well as any changes made to the DERP portfolio since the 2017 fuel proceeding.

Q. PLEASE DESCRIBE THE LEVELS OF SOLAR ADOPTION DEP HAS EXPERIENCED SINCE THE IMPLEMENTATION OF ACT 236.

A. Since January 1, 2015 DEP has seen significant growth in solar adoption as shown below in Table 1 and as a result is on track to meet the Act 236 goals.

Table 1: Duke Energy Progress Solar Adoption, as of March 1, 2018

	Act 236 Goal	Capacity Currently Installed	% of Goal
Utility Scale Solar (1MW – 10MW)	13	5	38.5%
Customer Scale Solar (<1MW)	13	6.9	53.1%
Small Scale Solar (<20kW)	3	2.5	83.3%

Notes

1. All values in MW-AC

2. Customer Scale Solar is inclusive of Small Scale Solar

The Company has encouraged solar adoption through the Net Energy Metering incentive and other DERP efforts discussed later in my testimony.

Q. PLEASE DESCRIBE THE DERP COSTS THAT ARE INCLUDED IN THE REVIEW, FORECAST, AND BILLING PERIODS.

A. Pursuant to Commission Order No. 2015-515, the Company offers its customers a variety of programs to support solar development. As a result, the Company incurred DERP incremental and avoided costs totaling \$1,593,836 in the period from March 1, 2017 through February 28, 2018 (the “review period”); anticipates incurring \$941,359 during

1 the period March 1, 2018 through June 30, 2018 (the “forecast period”); and projects to
2 incur \$3,424,811 in the period July 1, 2018 through June 30, 2019 (the “billing period”).

3 These costs represent the avoided and incremental costs associated with the
4 Company’s approved DERP offerings, including 1) Purchased Power Agreements
5 executed to fulfill the Company’s utility-scale solar goals under Act 236; 2) Distributed
6 Energy Resource (“DER”) Net Energy Metering (“NEM”) Incentive; 3) Solar Rebate
7 Program; 4) Carrying Costs on Deferred Amounts; 5) NEM Avoided Capacity Costs; 6)
8 NEM Meter Costs; 7) General and Administrative Expenses, including incremental labor
9 costs as a direct result of DERP, IT and billing enhancements, and other administrative
10 costs associated with delivering these new programs to customers. Table 2, below, is an
11 itemization of actual and expected DERP costs.
12

Table 2: DEP DERP Cost Summary - Review, Forecast, and Billing Periods

Cost Type	Review Period	Forecast Period	Billing Period
	3/1/17-2/28/18	3/1/18-6/30/18	7/1/18-6/30/19
DERP Incremental Costs			
Purchased Power Agreements	\$ -	\$ -	\$ -
DER NEM Incentive	152,811	115,446	572,127
Solar Rebate Program - Amortization	374,304	216,940	918,380
Shared Solar Program	-	-	-
Carrying Costs on Deferred Amounts	337,564	207,070	855,882
NEM Avoided Capacity Costs	6,868	5,395	23,678
NEM Meter Costs	26,011	14,304	27,381
General and Administrative Expenses	595,057	161,896	355,840
Interest on under-collection due to cap	53	-	-
Adjustments ¹	75,815	-	-
Total DER Incremental Costs	\$ 1,568,483	\$ 721,051	\$ 2,753,288
DERP Avoided Cost - Energy & Capacity			
Purchased Power Agreements	25,353	220,308	671,523
Shared Solar Program	-	-	-
Total DERP Avoided Cost	\$ 25,353	\$ 220,308	\$ 671,523
Total Incremental and Avoided Cost	\$ 1,593,836	\$ 941,359	\$ 3,424,811
Note			
¹ Adjustments primarily related to net metering true-up			
Sources			
Incremental Costs: Ward Exhibit 9 & 11			
Avoided Costs: Ward Exhibit 13 & 14			

Q. PLEASE DESCRIBE THE COMPANY'S DER NEM INCENTIVE AND COSTS.

A. The DER NEM Incentive is a credit available to eligible net energy metering customer-generators that enables the customer-generator to receive a full retail rate compensation for each kilowatt-hour (kWh) generated by their solar facility, for the period of time defined in the settlement agreement reached in Docket No. 2014-246-E.

1 The DER NEM Incentive approximates the difference between the value of a NEM
2 Distributed Energy Resource, as computed using the methodology approved in Docket No.
3 2014-246-E, and the retail rate. Settling Parties in that same docket agreed that the DER
4 NEM Incentive shall be treated as an incremental cost, as defined in S.C. Code Ann. § 58-
5 39-140, effectively socializing the cost of the DER NEM Incentive to all retail customers
6 as a component of the utilities' respective DER programs.

7 As shown on the "DER NEM Incentive" line in Table 2 above, the total costs
8 associated with this incentive are expected to grow significantly in the Billing Period. This
9 growth is related to an expected increase in customers who have elected service under
10 Rider RNM due to the availability of the Solar Rebate Program and the NEM incentive,
11 discussed below.

12 Table 3, below, depicts the current and expected number of customers and the
13 associated kilowatts (kW) (DC) of those who have elected to net meter. In accordance
14 with Act 236, the Company will make net energy metering available to customer generators
15 until the total nameplate generating capacity of net energy metering systems equals two
16 percent of the Company's retail peak demand, which is roughly 26,000 kW (AC). Rider
17 NM-SC refers to the Company's legacy net metering rider available from 2008-2015; Rider
18 NM-SC closed to new customers when Rider RNM was made available. In late 2015, all
19 customers who had previously elected Rider NM-SC were contacted by the Company and
20 encouraged to switch to Rider RNM due to the fact that Rider NM expires in 2020¹ and
21 Rider RNM expires in 2025.²

¹ See S.C. Code Ann § 58-40-20(A) (generators whose net energy metering facilities were energized prior to the availability of net energy metering rates approved by the commission under the terms of this chapter may remain in historic net energy metering programs through December 31, 2020).

² See Settlement Agreement in Docket No. 2014-246-E.

Table 3: DEP Net Energy Metering Status and Projections - Review, Forecast, and Billing

Rider RNM-3 and Rider NM-SC	Review Period	Forecast Period	Billing Period
	3/1/17-2/28/18	3/1/18 - 6/30/18	7/1/18 - 6/30/19
Capacity (kW-DC)	6,956	11,832	19,904
# of Customers	307	385	541

Q. COMMISSION ORDER 2015-194 REQUIRES THAT THE VALUE OF NEM DISTRIBUTED ENERGY RESOURCES IS COMPUTED ANNUALLY. WHAT IS THE 2018 VALUE AND HOW DID YOU ARRIVE AT THAT NUMBER?

A. Through the review of applicable input assumptions, the Company has updated the 2018 value of NEM Distributed Energy Resources to \$0.05036 per kWh for Schedules RES, R-TOU-D, and SGS and \$0.05026 for all other schedules. Table 4, below, lists the components of the methodology used to determine the value of NEM Distributed Energy Resources. The calculation is consistent with the methodology approved in Order No. 2015-194. The methodology includes all categories of potential costs or benefits to the utility system that are capable of quantification or possible quantification in the future. Where there is currently a lack of capability to accurately quantify a particular category, that category has been included in the methodology as a placeholder. For example, while “Avoided CO2 Emission Cost” is included as a component, its value is currently zero; a zero monetary value for CO2 will be used until state or federal laws or regulations result in an avoidable cost on Utility systems for these emissions, per the approved methodology.

Table 4: Value of NEM Distributed Energy Resource, by Component

Components of NEM Distributed Energy Resources Value	Component Value (\$ per kWh) Small PV ⁴	Component Value (\$ per kWh) Large PV ⁴
Avoided Energy Costs	\$0.036195	\$0.036187
Avoided Capacity Costs	\$0.013453	\$0.013367
Ancillary Services	\$0.000000	\$0.000000
T & D Capacity	\$0.000000	\$0.000000
Avoided Criteria Pollutants ¹	\$0.000024	\$0.000023
Avoided CO2 Emissions Costs	\$0.000000	\$0.000000
Fuel Hedge ²	\$0.000000	\$0.000000
Utility Integration & Interconnection Cost	\$0.000000	\$0.000000
Utility Administrative Cost	\$0.000000	\$0.000000
Environmental Costs	\$0.000000	\$0.000000
Subtotal	\$0.049672	\$0.049577
Line Losses ³	\$0.000686	\$0.000684
Total Value of NEM Distributed Energy Resources	\$0.05036	\$0.05026

Notes

¹ Pursuant to the Settlement Agreement reached in the Company's 2016 fuel case (Docket 2016-1-E), NOx & SOx that were previously included in marginal energy cost have been separately identified. The Company will identify other avoided criteria pollutant cost separately from marginal energy cost in future avoided cost analyses.

² Pursuant to the Settlement Agreement reached in the Company's 2017 fuel case (Docket No. 2016-1-E), the Company has calculated the fuel hedge value in a manner consistent with the definition according to the Settlement Agreement in Docket No. 2015-246-E, Attachment A. Because no fuel hedge exists, as calculated, there is no value to assign in the table.

³ Line loss factors are 1.15% on on-peak marginal energy, 1.138% for off-peak marginal energy and 2.0206% for marginal capacity per DEP's updated 2018 line loss analysis.

⁴ "Small PV" refers to a load shape reflecting generation installed by a lower usage residential or small commercial/industrial customer. "Large PV" refers to a load shape characteristic of generation by a customer with higher consumption requirements and applies to all other nonresidential rate schedules.

Q. HAVE YOU REVIEWED THE CALCULATION METHODOLOGY OF THE DER NEM INCENTIVE PROVIDED BY WITNESS WARD?

A. Yes. I have reviewed Ward Exhibit 15.

Q. IS THE CALCULATION METHODOLOGY PROVIDED BY WITNESS WARD CONSISTENT WITH THE METHODOLOGY APPROVED IN DOCKET NO. 2014-246-E AND OUTLINED IN COMMISSION ORDER 2015-194?

1 A. Yes, it is consistent with the methodology approved in Docket No. 2014-246-E, and it
2 applies the approved methodology using generic customer usage information and estimated
3 solar generation data.

4 **Q. PLEASE DESCRIBE EXHIBIT 1 TO YOUR TESTIMONY.**

5 A. Brown Exhibit 1 provides the Company's proposed 2018 net metering rider, Rider RNM-
6 6. The only changes to the tariff are the following: (1) the updated value of NEM
7 Distributed Energy Resources; (2) revisions to the general provisions to add SGS-TOU-
8 CLR to the list of schedules that do not qualify for Rider RNM³; and (3) the elimination of
9 the requirement to install a second revenue-grade meter on the net metering customer's
10 premises. The Company originally requested to install such additional meters, as reflected
11 in the current tariff, to allow the Company to study the impacts of net energy metering on
12 the distribution system. The Company proposes to now remove that requirement for new
13 net metering customers because it believes a sufficient number of second meters have been
14 installed to achieve the original objective. Finally, it is not necessary to update the rate
15 under the annual credit for excess generation until a new Purchased Power Schedule is
16 approved.

17 **Q. PLEASE DESCRIBE THE STATUS OF THE COMPANY'S SOLAR REBATE**
18 **PROGRAM.**

19 A. The Company's solar rebate program was implemented to assist the Company in meeting
20 its Customer Scale solar requirement (facilities less than 1,000 kW) under Act 236. The
21 Company has made available two solar rebate programs for its customers: the Small Solar
22 Rebate Program and the Large Solar Rebate Program. Both provide a qualified customer

³ Schedule SGS-TOU-CLR was approved in DEP's 2016 rate case and is for constant loads serving only cable television amplifiers.

with a rebate of \$1.00 per watt-dc upon successful energization of a solar facility that conforms to the sizing requirements outlined in Act 236. As shown in Table 5, below, interest in the solar rebate, as measured by solar rebate applications received, has exceeded available capacity per Act 236 goals.

Table 5: Duke Energy Progress Solar Rebate Program Status, as of March 1, 2018

Solar Facility Size	ACT 236 Goal	Total Capacity of Rebate Applications Received	Total Capacity of Rebate Applications Accepted into the Rebate Program
"Small" - Up to 20kW-AC	At least 3,250 kW	3,490	3,200
"Large" - 20.01kW-AC - 1,000kW-AC	9,750 kW	12,250	9,400
Total	13,000 kW	15,740	12,650
*All Values in kW-AC			

As a result of applications in excess of available capacity, an active waiting list is in place for the program.

Q. PLEASE DESCRIBE THE DERP COSTS ASSOCIATED WITH THE COMPANY'S SOLAR REBATE PROGRAM.

A. The incremental costs associated with the Solar Rebate Program and included in this filing are the amortization of rebates paid, carrying costs on deferred amounts, and general and administrative expenses required to manage the program, as shown in Table 2.

Q. PLEASE DESCRIBE THE STATUS OF THE COMPANY'S SHARED SOLAR PROGRAM.

A. The Company's Shared Solar Program, approved in Order No. 2015-515, is a means for multiple retail customers to subscribe to and share in the economic benefits of one renewable energy facility. To date, the Company has filed and received approval for a Shared Solar tariff which includes a low income component, finished internal billing system upgrades to enable the program, and signed agreements with three firms that will assist in outreach efforts as well as the application process for the low income component

1 of the program. The Company is deploying technologies to assist with managing the
2 program, such as a vendor website to receive applications and serve as a customer portal.
3 The Company is working toward dedicating 1,000 kW of an existing Purchased Power
4 Agreement (entered into pursuant to the utility-scale goals of Act 236) to the Shared Solar
5 Program. The Company plans to begin marketing the Shared Solar Program later this year.

6 **Q. PLEASE DESCRIBE THE DERP COSTS ASSOCIATED WITH THE**
7 **COMPANY'S SHARED SOLAR PROGRAM.**

8 **A.** The incremental costs associated with the Shared Solar Program are limited to the shared
9 solar incentive and general and administrative expenses, including labor and IT project
10 costs required to adapt the Company's database and billing systems to the Shared Solar
11 transaction. These costs are listed as General and Administrative Expenses on Table 2.

12 **Q. PLEASE DESCRIBE THE RESULTS OF THE COMPANY'S REQUEST FOR**
13 **PROPOSALS OF UTILITY-SCALE SOLAR FACILITIES, THE ASSOCIATED**
14 **TIMELINE, AND COSTS.**

15 **A.** In the fall of 2015, the Company solicited competitive bids for solar PV from facilities
16 totaling 13,000 kW (AC), the equivalent of one percent of the Company's estimated South
17 Carolina retail peak demand. This solicitation resulted in 17 projects totaling 140 MW
18 being placed on a short list in March of 2016. The Company has executed two PPAs
19 totaling 15,000 kW (AC), which completes the Company's utility-scale solar goals under
20 Act 236. As described previously, the Company is working to dedicate 1,000 kW of the
21 15,000 kW to the Company's Shared Solar Program. The Company has included
22 incremental and avoided costs associated with one of the PPAs, under which the project
23 began delivering power at the end of 2017. These costs are listed on Table 2. No

1 incremental or avoided costs are included related to the second PPA, as it is not anticipated
2 to be energized until the end of 2019.

3 **Q. PLEASE DESCRIBE GENERAL AND ADMINISTRATIVE EXPENSES,**
4 **INCLUDING INCREMENTAL LABOR COSTS AS A DIRECT RESULT OF**
5 **DERP, IT AND BILLING ENHANCEMENTS, AND OTHER ADMINISTRATIVE**
6 **COSTS ASSOCIATED WITH DELIVERING THESE NEW PROGRAMS TO**
7 **CUSTOMERS.**

8 A. As stated previously, included in this filing are incremental labor costs required to manage
9 and implement the NEM Incentive program, the Solar Rebate Program, and the Shared
10 Solar Program. Also included are the incremental costs required to adapt the Company's
11 database and billing systems to accommodate Shared Solar transactions.

12 **Q. PLEASE DESCRIBE THE COMPANY'S EFFORTS TO COMMUNICATE WITH**
13 **STAKEHOLDERS ABOUT DER PROGRAMS AND PROGRAM CHANGES IN**
14 **THE PAST YEAR?**

15 A. Since the Commission approved the Company's DER Program application in July of 2015,
16 the Company has utilized various communication and outreach tools to ensure that solar
17 stakeholders and retail customers have access to information about the Company's
18 programs and are able to communicate with representatives from the Company about the
19 programs. For example, the Company has: 1) conducted quarterly DER Collaborative
20 meetings with a diverse group of stakeholders representing the environmental community,
21 low income community, solar installers, solar developers, The Alliance for Solar Choice,
22 SolarCity, Sunrun, Walmart, Nucor, and the Office of Regulatory Staff; 2) conducted
23 multiple educational sessions for solar installers and developers at meetings of the South

1 Carolina Solar Council as well as for Shared Solar at a meeting of the South Carolina Clean
2 Energy Business Alliance; 3) conducted webinars for solar installers, particularly as
3 interest in the solar rebate program accelerated; 4) begun providing a summary of net
4 metering adoption on the Duke Energy website; 5) begun working with an environmental
5 justice stakeholder group in the Pee Dee region to promote the Shared Solar low income
6 subscriptions; 6) provided call center support to retail customers and solar installers via its
7 Renewable Service Center, which is staffed with approximately twenty professionals. The
8 Company uses these outreach efforts as well as regular communication to keep
9 stakeholders and retail customers informed of the status of the program offerings and other
10 developments related to its DER programs.

11 **Q. DOES THIS CONCLUDE YOUR TESTIMONY?**

12 **A. Yes.**